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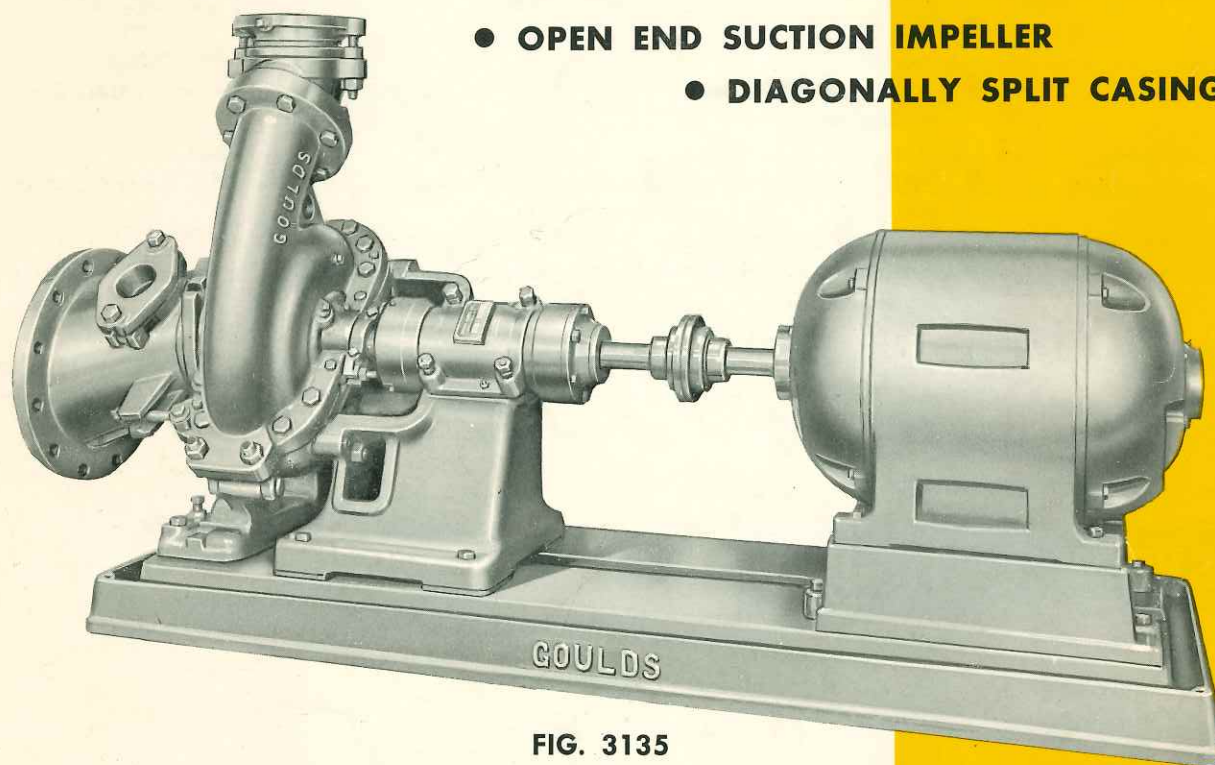
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Goulds

CENTRIFUGAL STOCK PUMPS



- OPEN END SUCTION IMPELLER
- DIAGONALLY SPLIT CASING TYPE

FIG. 3135

Especially designed for:

Handling paper stock of all kinds and consistencies in mills of all types; also for fruit pulps, mashes and similiar materials.

GOULDS PUMPS, INC. • SENECA FALLS, N. Y.

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Representatives in all principal cities

FEATURES

- Separate liquid end—economical to build in special metals. Available in materials of construction shown in parts list Pg. 5. Can also be furnished on order in other sand cast, machinable alloys.
- Centerline discharge—vertical centerline of suction and discharge coincide. Eliminates need for right and left hand pumps and simplifies layout of piping. For horizontal discharge, merely rotate discharge elbow 180°.
- Self Venting Casing—discharge at highest point in casing eliminates air binding and insures steady flow.
- Casing diagonally split. Rotating element, including bearing assembly, easily removed without disturbing pipe connections. Hinged cover reduces considerably the time and effort required to remove rotating element.
- Special warped vane, heavy duty, non-clogging open impeller having back wall ejector vanes.
- Heavy, renewable impeller sideplates.
- Axial adjustment provided to maintain proper clearance between impeller and suction sideplate.
- Suction connection, having large hand hole for cleaning, made in various sizes to suit suction pipe requirements.
- Can use Fig. 3105 rotating element—eliminates double inventory where both styles of units are used.
- Telescopic joint included in discharge piece for easy removal of upper half casing. Also acts as and eliminates need for expansion joint near pump when the discharge piping is in place.

SPECIFICATIONS

CASING

Diagonally split. Upper and lower halves bolted and doweled together. Unique hinged cover casing with jacking bolts allows opening of pump casing permitting inspection, maintenance and removal of entire rotating element without disturbing piping connections. Casing provided with washout connections back of both sideplates for flushing. Discharge is located at highest point of casing providing positive self venting feature.

Discharge connector telescopes into the discharge elbow, forming an assembly which is flanged and bolted to, and becomes a part of the upper half casing assembly. This telescopic feature of design makes possible quick and convenient opening of casing.

The suction connection is a separate piece, eccentric in shape, gland packed, and can be furnished in various pipe sizes according to requirements of installation. This construction permits an even flow of stock into impeller entrance, avoids any possibility of high points which might permit air pockets to form in the suction line. Large hand hole for cleaning is furnished.

IMPELLER

Open, end suction, non-clogging type. Inlet tips of vanes are warped to give screw conveyor effect, insuring a positive even flow of stock into the impeller eye. This also prevents water separation of stock. Back wall of impeller provided with ejector vanes following the same curvature of the main vanes of the impeller which prevent entrance and jamming of stock or other solid material between back impeller wall and the stationary sideplate. Impeller secured to flanged shaft sleeve by lock nuts. There is no nut or other obstruction at impeller eye to catch fibre, strings or other material.

SIDE PLATES

Easily renewable, securely locked in pump casing and machined to the contour of the impeller surfaces.

SHAFT

Of more than ample size to transmit power demand and with proper span between bearings to keep deflection and vibration to a minimum.

SHAFT SLEEVE

Flanged, securely bolted and locked to the impeller. Sleeve is keyed to shaft, and secured by lock nut and washer which are located in recess in the back of the impeller and are not exposed to stock or other materials handled by the pumps. "M" group pumps may be supplied without shaft sleeve, see sectional dwg. Pg. 4.

STUFFING BOX

Readily accessible, provided with ample number of packing rings. Throat bushing and water seal ring are integral, with tapped connection for fresh water seal or "in-and-out" flushing seal. In repacking, removal of old packing to first metal obstruction precludes necessity of "fishing" for water seal ring.

BEARINGS

Standard construction provides for grease lubricated roller bearings sealed against moisture and dirt and are provided with reliefs to prevent overlubrication.

Thrust or coupling end bearing is a spherical roller bearing shouldered and locked in place on shaft with lock nut and washer. Takes all thrust in either direction and a part of the radial load.

Radial or inboard bearing is a cylindrical roller bearing pressed against shaft shoulder, is free to float axially and takes radial load only.

Oil lubricated ball bearings may be provided on order at extra cost.

AXIAL ADJUSTMENT

When wear occurs between impeller and suction sideplate due to abrasives in the material handled, shaft and impeller can be moved axially by simple external adjustment toward suction sideplate to restore original clearance.

DIRECTION OF ROTATION

Right Hand—Clockwise viewed from motor or drive end.

FLEXIBLE COUPLING

Falk Type F all-steel regularly supplied.

BEDPLATE

Pump and driving unit are mounted on a substantial cast iron bedplate with a continuous drip canal around the four sides. Tapped for drain connection and provided with grouting holes.

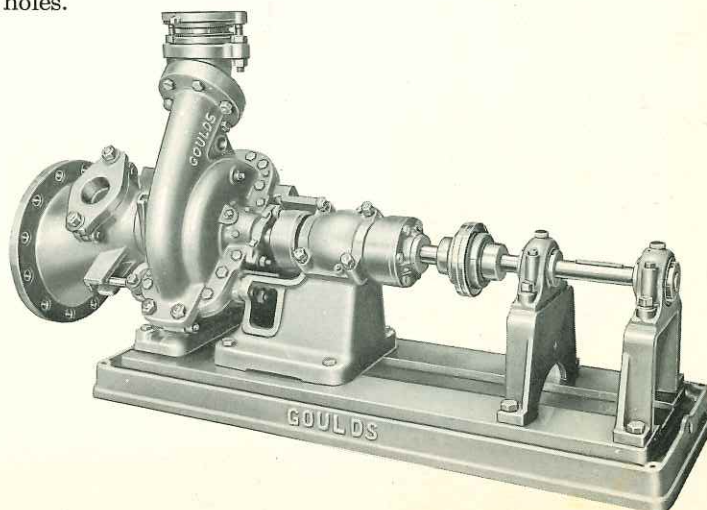


Fig. 3135
For
Belt Drive

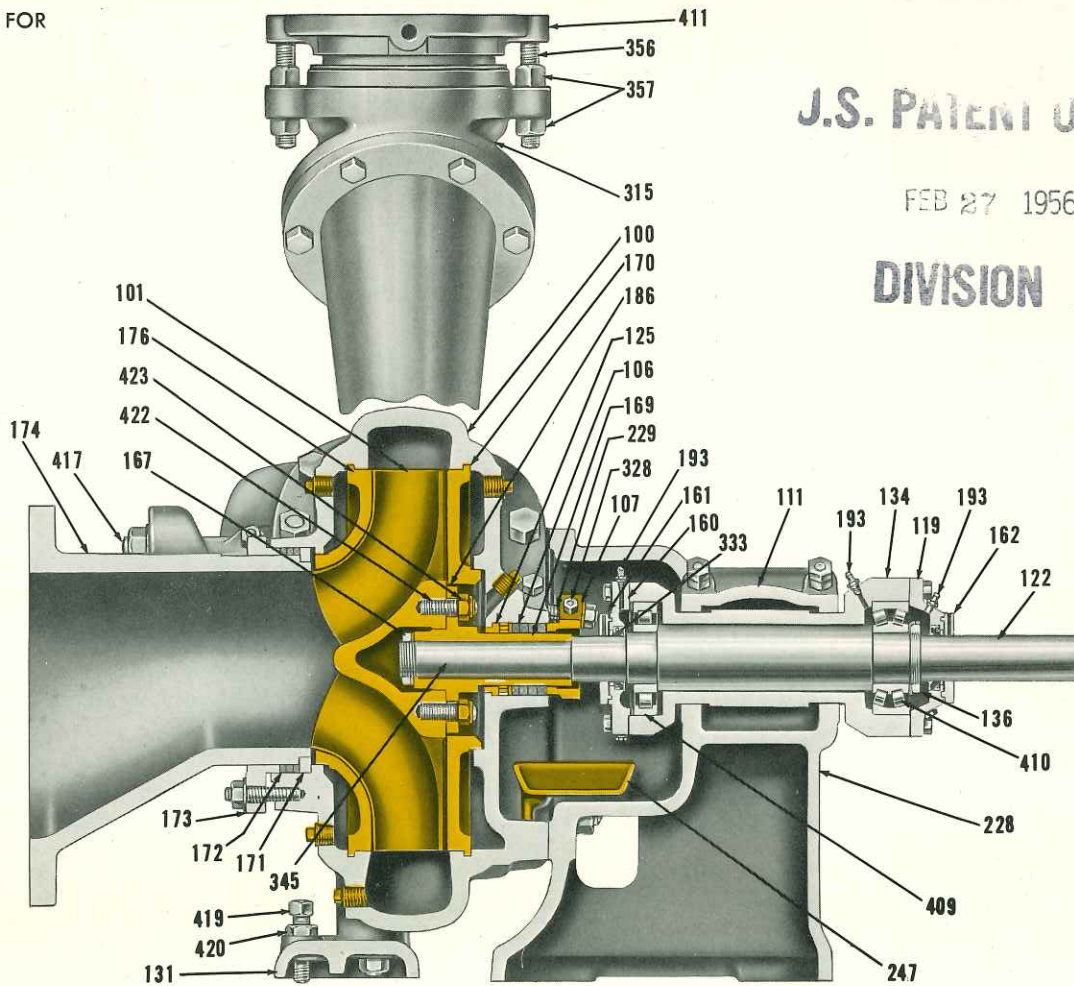
SECTIONAL VIEW—Fig. 3135

PATENT APPLIED FOR

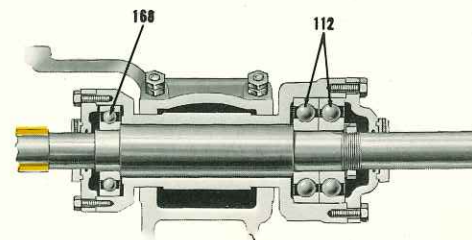
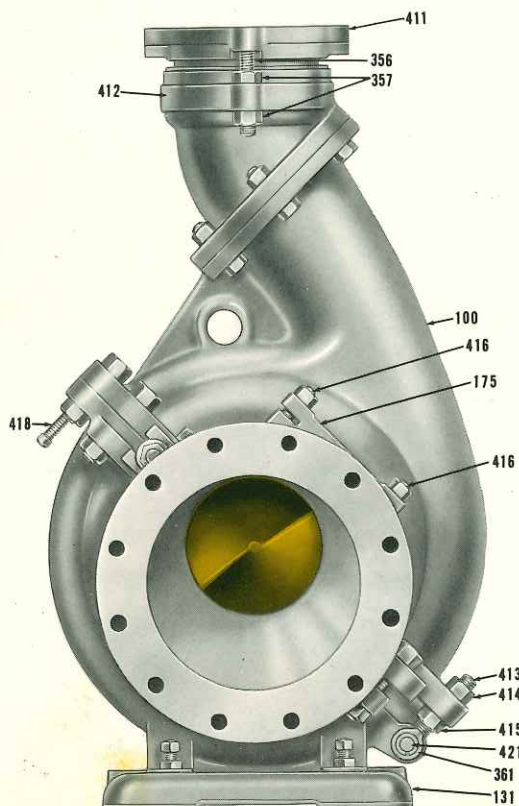
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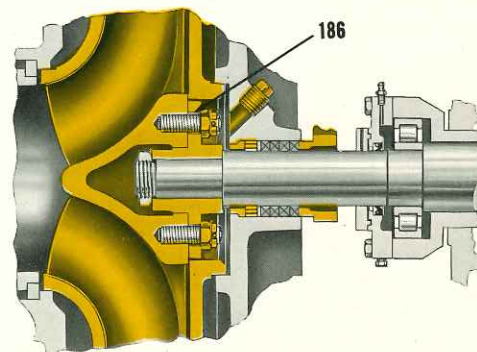
DIVISION 9



STANDARD CONSTRUCTION—ROLLER BEARINGS, GREASE LUBRICATED



BALL BEARINGS, OIL LUBRICATED



LESS SHAFT SLEEVE CONSTRUCTION
"M" GROUP ONLY

Parts List, Materials of Construction and Parts Interchangeability Chart

ITEM NO.	NO. REQ'D. PER PUMP	PART NAME	MATERIAL						INTERCHANGEABILITY BY GROUP AND CASING CLASS							
			BRZ. FTD.	ALL IRON	ALL BRZ.	A1S1 316	ALL IRON S.S. TRIM	ALL BRZ. S.S. TRIM	GROUP - S				GROUP - M			
									3"x6"-14	3"x8"-14	4"x10"-14	4"x12"-14	6"x12"-16	6"x14"-16	8"x14"-20	8"x16"-20
100	1-UP	CASING														
101	1-LOW	IMPELLER	1000	1000	1103	A1S1 316	1000	1103							8, 8S, 8L	
106	1 SET	STUFFING BOX PACKING	1106	1000	1103	A1S1 316	1000	1103								
107	1	STUFFING BOX GLAND (SPLIT)			1/2" X 1/2" ASBESTOS											
111	1	BEARING CAP			1000	A1S1 316	1000	1103								
112	1	BALL BEARING (THRUST BEARING)			STEEL											
119	1	BEARING END CAP (OUTER)			1000											
1221	1	SHAFT			1000											
125	1	STUFFING BOX BUSHING	SAE 4140	1000	A1S1 303	SAE 4140	A1S1 303									
131	1	PUMP FOOT	1103		1103	A1S1 316	1000	1103								
134	1	BEARING SHELL			1000											
136	1	BEARING LOCK NUT			STEEL											
160	1	BEARING END CAP (INNER)			1000											
161	1	WATER THROWER (INNER)			1000											
162	1	WATER THROWER (OUTER)			1000											
167	1	IMPELLER LOCK NUT			STEEL											
168	1	BALL BEARING (RADIAL BEARING)			STEEL											
169*	1	SHAFT SLEEVE	1106	1000	1106	A1S1 316										
170	1	DISCHARGE SIDEPLATE	1106	1000	1106	A1S1 316	1000	1106								
171	1	SUCTION PIECE RING		1000	1103	A1S1 316	1000	1103							8, 8S, 8L	
172	1 SET	SUCTION PIECE PACKING			3/8" X 3/8" ASBESTOS											
173	1	SUCTION PIECE GLAND			1000	A1S1 316	1000	1103								
174	1	SUCTION PIECE			1000	A1S1 316	1000	1103								
175	1	HAND HOLE COVER			1000	A1S1 316	1000	1103	306	308	410	412	612	614	814	816
176	1	SUCTION SIDEPLATE	1106	1000	1106	A1S1 316	1000	1106	M						8, 8S, 8L	
186*	1	SHAFT FLANGE	1106	1000	1106	A1S1 316										
193	3	GREASE FITTING			STEEL											
228	1	SUPPORT HEAD			1000											
229	2	STUFFING BOX SWING BOLT	STEEL		A1S1 304	STEEL	A1S1 304									
247	1	DRIP BASIN	NONE		1103	A1S1 316	NONE	1103								
315	1	DISCHARGE ELBOW	1000		1103	A1S1 316	1000	1103								
328	2	GLAND BOLT (FOR JOINING GLAND HALVES)	STEEL		BRASS	A1S1 303	STEEL	BRASS								
332	1	GREASE SEAL (OUTER)														
333	1	GREASE SEAL (INNER)														
345	1	SHAFT FLANGE KEY			A1S1 303											
356	2	DISCH. CONNECTOR ADJUSTING STUD			STEEL											
357	4	HEX. NUT (DISCH. CONNECTOR ADJUST. STUD)			STEEL											
359	2	BEARING SHELL ADJUST. SCREW (HEX. HD TAP BOLT)			STEEL											
361	2	SNAP RING			STEEL											
409	1	ROLLER BEARING (RADIAL BEARING)			STEEL											
410	1	ROLLER BEARING (THRUST BEARING)			STEEL											
411	1	DISCHARGE CONNECTOR	1000		1103	A1S1 316	1000	1103								
412	1	O-RING			HYCAR - BUNA "N"											
413	2	CASING HINGE BOLT			STEEL											
414	2	HEX. NUT (CASING HINGE BOLT)			STEEL											
415	2	HEX. JAM NUT (CASING HINGE BOLT)			STEEL											
416	2	HAND HOLE COVER - SWING BOLT			STEEL											
417	2	SUCTION PIECE - SWING BOLT			STEEL											
418	1	CASING - JACK BOLT			STEEL											
419	2	LEVELLING SCREW			STEEL											
420	2	JAM NUT (LEVELLING SCREW)			STEEL											
421	1	CASING HINGE PIN			STEEL											
422	1 SET	IMPELLER STUD	BRASS	STEEL	BRASS	A1S1 316										
423	1 SET	NUT (IMPELLER STUD)	BRASS	STEEL	BRASS	A1S1 316										

* ON "S" GROUP 169 AND 186 SEPARATE PARTS
ON "M" GROUP 169-ONLY SINGLE PART SLEEVE CONSTRUCTION
ON "M" GROUP 186-ONLY SINGLE PART LESS-SLEEVE CONSTRUCTION

† ON BRZ. FTD. AND ALL IRON LESS-SLEEVE CONSTRUCTION SHAFT IS OF SAE 4150, FLAME HARDENED THRU STUFF. BOX.
ON A1S1 316 AND S. S. TRIM LESS-SLEEVE CONSTRUCTION SHAFT IS OF A1S1 316.

Construction Details

WEIGHT - BRONZE FITTED BARE PUMP	780	795	920	950	1525	1560	1925	2000
CASING THICKNESS - VOLUTE	1 1/16"		3/4"		7/8"		1"	
CASING THICKNESS - SIDE WALLS		5/8"			3/4"		7/8"	
MAXIMUM DIAMETER SOLIDS	1-1/16"		2"		3"		4"	
STUFFING BOX - BORE		3-1/4"				3-3/4"		
STUFFING BOX - DEPTH (TO STUFFING BOX BUSHING)				2-1/8"				
STUFFING BOX - PACKING SIZE				1/2" X 1/2"				
STUFFING BOX - NO. OF PACKING RINGS				4				
SHAFT DIA. AT IMPELLER		1-9/16"			2"			
SHAFT DIA. IN SHAFT SLEEVE		1-7/8"				2"		
SHAFT DIA. AT COUPLING END							2.3755"	
							2.3750"	
OUTSIDE DIA. OF SHAFT SLEEVE (OR SHAFT LESS SLEEVE M-GROUP ONLY)		2-1/4"					2-3/4"	
ROLLER BEARING - (RADIAL BEARING)					SKF-NJ310 or EQUAL		SKF-NJ314 or EQUAL	
ROLLER BEARING (THRUST BEARING)					SKF-22310 or EQUAL		SKF-22314 or EQUAL	
BALL BEARING (RADIAL BEARING)					MRC-3105 or EQUAL		MRC-314R or EQUAL	
BALL BEARING (THRUST BEARING)					MRC-7410DB or EQUAL		MRC-7414DB or EQUAL	
MAXIMUM SUCTION PRESSURE					100 PSI			
MAXIMUM TOTAL PRESSURE					150 PSI			

Typical Analysis of Materials of Construction

MATERIAL	CU%	SN%	PB%	P%	CR%	NI%	C(MAX.) %	MO%	FE%
1103	76.8	8	15	.20	-	-	-	-	-
1106	79.9	10	10	.10	-	-	-	-	-
1000					CAST IRON				
A1S1 303	-	-	-	-	18-20	8-10	.20	.60 MAX.	BAL.
A1S1 304	-	-	-	-	18-20	8-10	.08	-	BAL.
A1S1 316	-	-	-	-	18-20	8-10	.07	2.5-3.5	BAL.

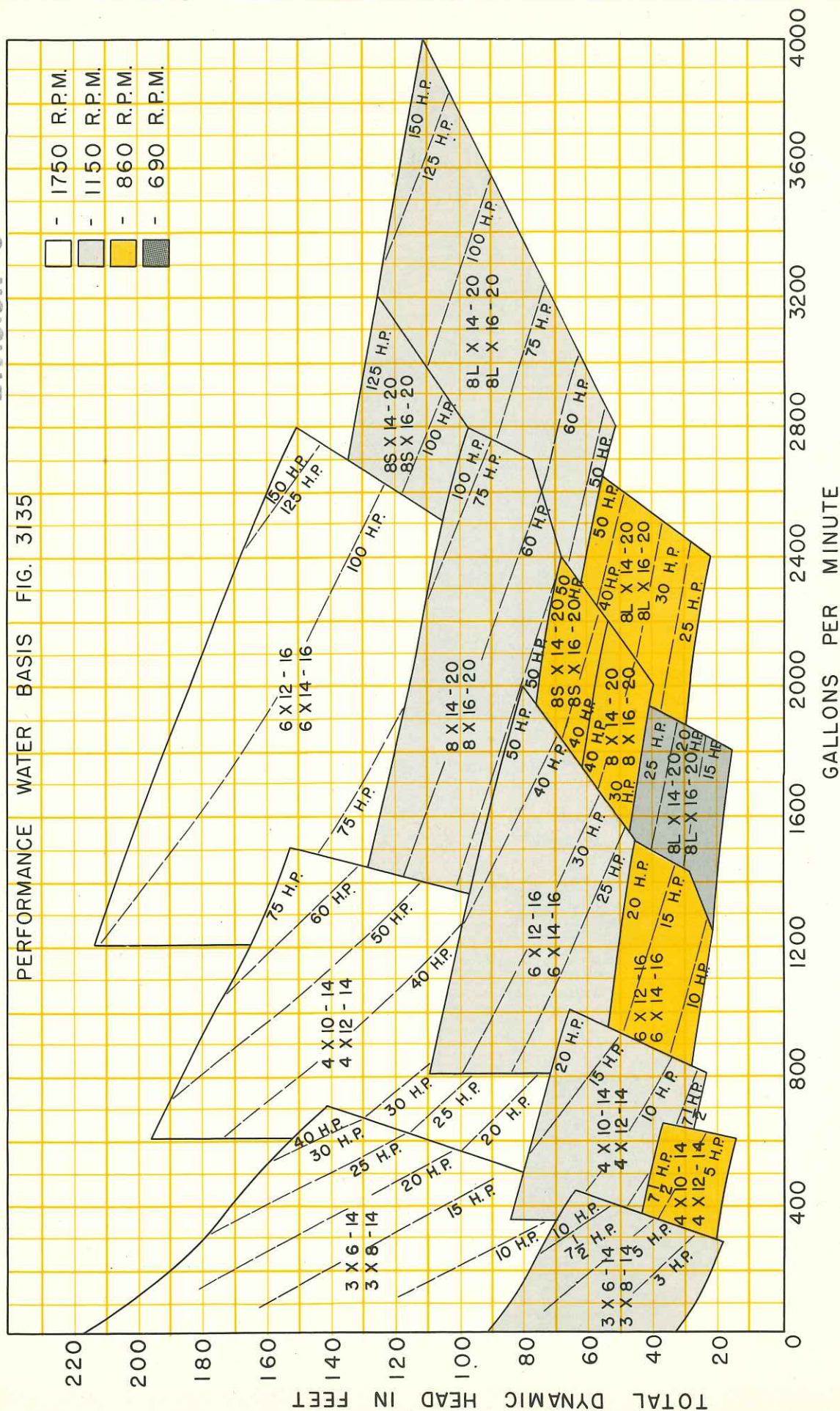
A1S1 303 SAME AS KA2, 18-8
A1S1 304 SAME AS KA2-S, 18-8S, ACl - CF - 8
A1S1 316 SAME AS KA2-SMO, 18-8SMO, ACl - CF - 8M

PERFORMANCE CURVES — Fig. 3135

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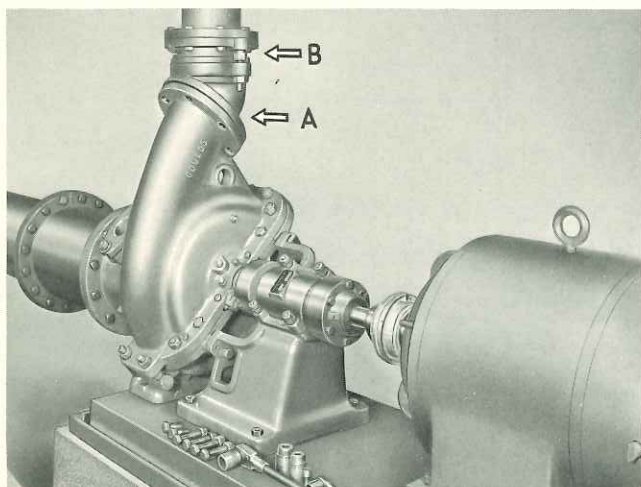


NEW DESIGN

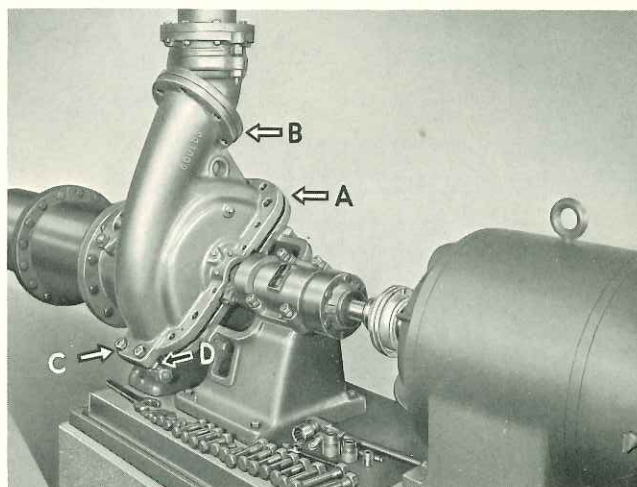
Saves Time and Effort

REMOVING ROTATING ELEMENT

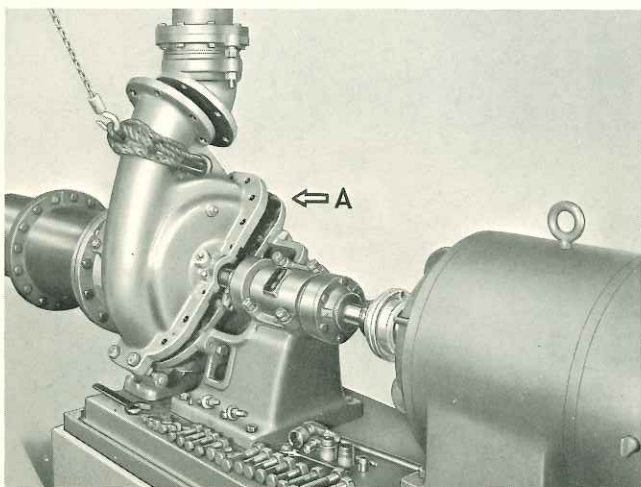
Realizing the importance in the paper industry of making an overhaul or repair in a limited down-time (usually the 2 to 4 hours allowed for wire change), Goulds developed this new design hinged cover casing with jacking bolts which saves time and effort when removing the upper half of pump casing to check or remove the rotating element. The following photos and outline of the procedure readily show the advantages this new design offers.



1st Step. Remove bolts connecting discharge elbow and upper half pump casing (A). To provide clearance and preserve gasket, telescope discharge elbow into discharge connection by jacking arrangement (B) which operates by loosening upper nuts on both sides then tightening lower nuts.



2nd Step. Remove parting bolts connecting upper and lower half of pump casing. Raise upper half casing by loosening top nuts (C) on hinge pins till they are flush with end of pins. Raise casing off sideplate locks by tightening hex nuts (D) below upper half flange. To complete breaking flange between upper and lower half pump casing, jacking screw (A) is employed.



3rd Step. Attach chain fall through space provided in upper half pump casing (see photo) and continue to raise casing by means of jack screws (A). On smaller size units chain fall is not required, as upper half casing can be hinged back by inserting a rod or pipe through cored hole in web of upper half of pump casing.

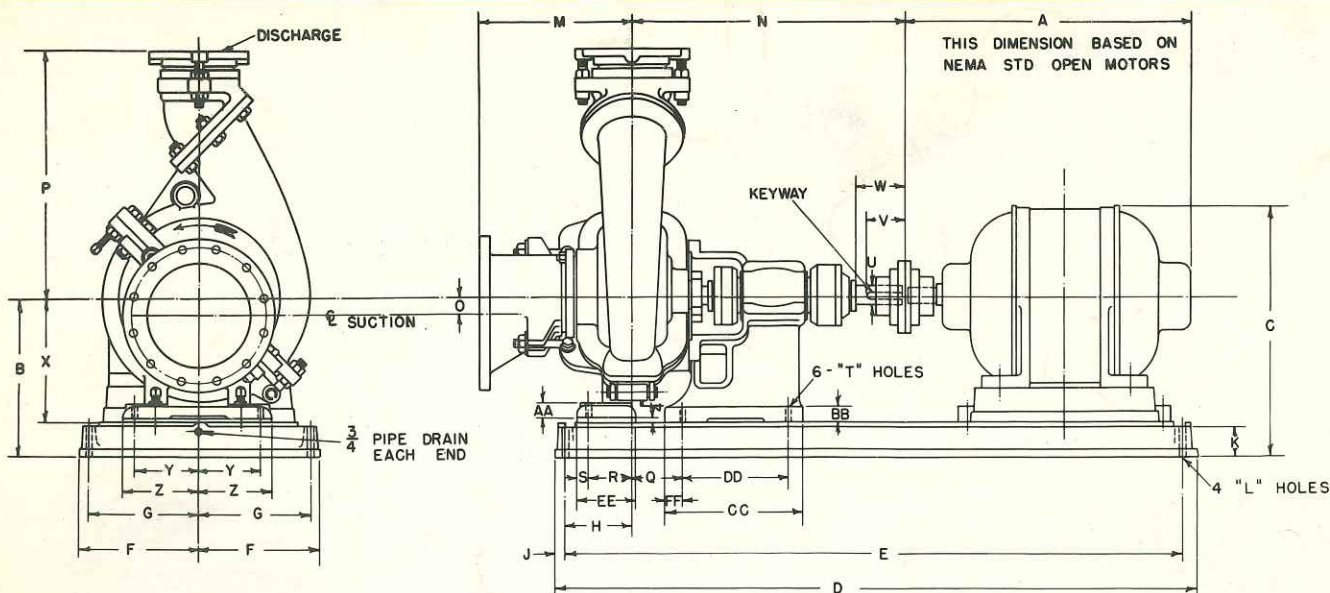


4th Step. Pump is shown completely open. Remove bearing cap, disconnect coupling and rotating element can be readily lifted from casing.

To Reassemble Pump

Follow the preceding steps in reverse.

DIMENSIONS . . . All dimensions are in inches. Not to be used for construction purposes



GROUP	MOTOR FRAME	A	B	C	D	E	F	G	H	J	K	L
S	213	5 1/16	16 1/4	21 1/8	61	58 1/2	11 1/2	10 1/4	9	1 1/4	3 5/8	5 5/8
	215	17 1/16	16 1/4	21 1/8	61	58 1/2	11 1/2	10 1/4	8 3/4	1 1/4	3 5/8	5 5/8
	224	17 1/16	16 1/4	22 1/8	61	58 1/2	11 1/2	10 1/4	8 3/4	1 1/4	3 5/8	5 5/8
	225	17 3/4	16 1/4	22 1/8	61	58 1/2	11 1/2	10 1/4	8	1 1/4	3 5/8	5 5/8
	254	20 3/8	16 1/4	22 3/8	67	64 1/2	11 1/2	10 1/4	10 1/4	1 1/4	3 5/8	5 5/8
	254U	20 3/8	16 1/4	22 3/8	67	64 1/2	11 1/2	10 1/4	10	1 1/4	3 5/8	5 5/8
	256U	22 3/8	16 1/4	22 3/8	67	64 1/2	11 1/2	10 1/4	9 1/4	1 1/4	3 5/8	5 5/8
	284	23	16 1/4	23 1/8	67	64 1/2	11 1/2	10 1/4	9	1 1/4	3 5/8	5 5/8
	284U	24	16 1/4	23 1/8	67	64 1/2	11 1/2	10 1/4	8 3/4	1 1/4	3 5/8	5 5/8
	286U	25 1/2	16 1/4	23 1/8	67	64 1/2	11 1/2	10 1/4	7 3/4	1 1/4	3 5/8	5 5/8
	324	25 1/8	16 1/4	24 1/8	67	64 1/2	11 1/2	10 1/4	7 1/2	1 1/4	3 5/8	5 5/8
	324U	26 1/2	16 1/4	24 1/8	73	70 1/2	11 1/2	10 1/4	10	1 1/4	3 5/8	5 5/8
	326	27 1/8	16 1/4	24 1/8	73	70 1/2	11 1/2	10 1/4	10	1 1/4	3 5/8	5 5/8
	326U	28 1/4	16 1/4	24 1/8	73	70 1/2	11 1/2	10 1/4	9 3/4	1 1/4	3 5/8	5 5/8
	364	28 1/8	17 1/4	26 3/8	72 1/2	69 1/2	12 1/2	11 1/4	9	1 1/4	4 1/2	4 1/2
	365	29 1/8	17 1/4	26 3/8	72 1/2	69 1/2	12 1/2	11 1/4	8 3/4	1 1/4	4 1/2	4 1/2
	404	32 3/8	17 1/4	27 1/4	72 1/2	69 1/2	12 1/2	11 1/4	8 3/4	1 1/4	4 1/2	4 1/2
	405	33 3/8	17 1/4	27 1/4	72 1/2	69 1/2	12 1/2	11 1/4	8	1 1/4	4 1/2	4 1/2
	405S	31	17 1/4	27 1/4	72 1/2	69 1/2	12 1/2	11 1/4	9 1/2	1 1/4	4 1/2	4 1/2
	444	36 3/8	17 1/4	28 1/4	77 1/4	74 1/2	13 1/2	13 1/4	9 1/2	1 1/4	4 1/2	4 1/2
	444S	34	17 1/4	28 1/4	77 1/4	74 1/2	13 1/2	13 1/4	8 1/2	1 1/4	4 1/2	4 1/2
	445	38 3/8	17 1/4	28 1/4	77 1/4	74 1/2	13 1/2	13 1/4	8 1/2	1 1/4	4 1/2	4 1/2
	445S	36	17 1/4	28 1/4	77 1/4	74 1/2	13 1/2	13 1/4	9 1/2	1 1/4	4 1/2	4 1/2
	504U	41 7/8	17 1/2	30	82 1/4	79 1/2	16 1/2	15 1/4	9 1/4	1 1/4	4 1/2	4 1/2
	504S	37 1/2	17 1/2	30	76 1/4	73 1/2	16 1/2	15 1/4	8 1/4	1 1/4	4 1/2	4 1/2

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GROUP	MOTOR FRAME	A	B	C	D	E	F	G	H	J	K	L
M	284U	24	22	28 1/8	77 1/4	74 1/2	15 1/8	13 1/4	11	1 1/4	4 1/2	4 1/2
	286U	25 1/2	22	28 1/8	77 1/4	74 1/2	15 1/8	13 1/4	10	1 1/4	4 1/2	4 1/2
	324	25 1/8	22	30	77 1/4	74 1/2	15 1/8	13 1/4	9 1/4	1 1/4	4 1/2	4 1/2
	324U	26 1/2	22	29 7/8	77 1/4	74 1/2	15 1/8	13 1/4	9 1/4	1 1/4	4 1/2	4 1/2
	326	27	22	30	80 1/4	77 1/2	15 1/8	13 1/4	11	1 1/4	4 1/2	4 1/2
	326U	28 1/4	22	29 7/8	80 1/4	77 1/2	15 1/8	13 1/4	10 1/4	1 1/4	4 1/2	4 1/2
	364	28 1/8	22	31 1/8	80 1/4	77 1/2	15 1/8	13 1/4	10 1/2	1 1/4	4 1/2	4 1/2
	365	29 1/8	22	31 1/8	80 1/4	77 1/2	15 1/8	13 1/4	9 1/2	1 1/4	4 1/2	4 1/2
	404	32	22	32	86 1/2	83 1/2	15 1/8	13 1/4	12	1 1/4	4 1/2	4 1/2
	405	33	22	32	86 1/2	83 1/2	15 1/8	13 1/4	10 1/2	1 1/4	4 1/2	4 1/2
	405S	31	22	32	86 1/2	83 1/2	15 1/8	13 1/4	12	1 1/4	4 1/2	4 1/2
	444	36 7/8	22	33	86 1/2	83 1/2	15 1/8	13 1/4	9 1/4	1 1/4	4 1/2	4 1/2
	444S	34	22	33	86 1/2	83 1/2	15 1/8	13 1/4	11 1/4	1 1/4	4 1/2	4 1/2
	445	38 1/8	22	33	92 1/2	89 1/2	15 1/8	13 1/4	12 1/4	1 1/4	4 1/2	4 1/2
	445S	36	22	33	86 1/2	83 1/2	15 1/8	13 1/4	11	1 1/4	4 1/2	4 1/2
	504U	41 7/8	22	34 1/2	96 1/2	93 1/2	16 1/8	15 1/4	12 3/4	1 1/4	4 1/2	4 1/2
	504S	37 1/2	22	34 1/2	88 1/2	85 1/2	16 1/8	15 1/4	11	1 1/4	4 1/2	4 1/2
	505	43 1/8	22	34 1/2	96 1/2	93 1/2	16 1/8	15 1/4	11 1/2	1 1/4	4 1/2	4 1/2
	505S	39 1/2	22	34 1/2	88 1/2	85 1/2	16 1/8	15 1/4	9 1/2	1 1/4	4 1/2	4 1/2

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GROUP	DISCH SIZE	SUCT SIZE	CASING CLASS	M	N	O	P	Q	R	S	T	U	KEYWAY	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF
S	3	6	14	18 $\frac{3}{4}$	30 $\frac{1}{8}$	1 $\frac{1}{2}$	21	5 $\frac{1}{2}$																
	3	8	14	18 $\frac{3}{4}$	30 $\frac{1}{8}$	1 $\frac{1}{2}$	21	5 $\frac{1}{2}$	5	1 $\frac{1}{4}$	7 $\frac{1}{8}$	18 $\frac{7}{8}$ 18 $\frac{7}{8}$ 50	1 $\frac{1}{2}$ X 1 $\frac{1}{4}$	3	5	12 $\frac{1}{4}$	6	7 $\frac{1}{4}$	2	1 $\frac{3}{4}$	15 $\frac{3}{4}$	12	6 $\frac{3}{4}$	2
	4	10	14	19 $\frac{1}{4}$	30 $\frac{1}{8}$	2	23 $\frac{1}{2}$	6																
	4	12	14	21 $\frac{1}{4}$	30 $\frac{1}{8}$	3	23 $\frac{1}{2}$	6																
M																								
	6	12	16	19 $\frac{11}{16}$	36	2	28	5 $\frac{3}{4}$																
	6	14	16	21 $\frac{1}{16}$	36	3	28	5 $\frac{3}{4}$	6	1 $\frac{1}{2}$	1	23 $\frac{7}{8}$ 23 $\frac{7}{8}$ 50	9 X 3 32	4 $\frac{1}{2}$	6	17	8 $\frac{3}{4}$	10 $\frac{1}{4}$	2 $\frac{1}{4}$	2	19	14 $\frac{1}{2}$	8	2 $\frac{1}{2}$
	8	14	20	20 $\frac{15}{16}$	37 $\frac{1}{4}$	2 $\frac{3}{8}$	34	7																
	8	16	20	23 $\frac{1}{16}$	37 $\frac{1}{4}$	3 $\frac{3}{8}$	34	7																

FLANGE DIMENSIONS					
I.D.	O.D.	B.C.	THICKNESS	NO. HOLES	SIZE HOLES
3	7 1/2	6	3/4	4	3/4
4	9	7 1/2	15/16	8	3/4
6	11	9 1/2	1	8	7/8
8	13 1/2	11 1/4	1 1/8	8	7/8
10	16	14 1/4	1 3/16	12	1
12	19	17	1 1/4	12	1
14	21	18 3/4	1 3/8	12	1 1/8
16	23 1/2	21 1/4	1 7/8	16	1 1/8